IN THE CLAIMS:

The following listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

Claims 1-29. *(Canceled)*

30. *(Previously Amended)* A method for three dimensional inspection of a lead on a part, the method comprising the steps of:

using a camera to receive an image of the lead;

transmitting the image of the lead to a frame grabber;

providing fixed optical elements to obtain a side perspective view of the lead;

transmitting the side perspective view of the lead to the frame grabber;

operating a processor to send a command to the frame grabber to acquire images of pixel values from the camera;

processing the pixel values with the processor to calculate a three dimensional position of the lead;

determining a lead center location and a lead diameter in pixels and storing the lead center location and lead diameter in memory;

converting the pixel values into world locations by using pixel values and parameters determined during calibration wherein

the world locations represent physical locations of the lead with respect to world coordinates defined during calibration, wherein a Z height of each lead is calculated in world coordinates in pixel values by combining a location of a center of a lead from a bottom view with a reference point of the same lead from a side perspective view;

converting the world coordinates to part values using a rotation, X placement value and Y placement value to define part coordinates for an ideal part where the part values represent physical dimensions of the lead including lead diameter, lead center location in X part and Y part coordinates and lead height in Z world coordinates; and

comparing ideal values defined in a part file to calculate deviation values that represent a deviation of the center of the lead from its ideal location.

31. *(Original)* The method of claim 30 wherein the deviation values may include lead diameter in several orientations with respect to an X placement value and a Y placement value, lead center in the X direction, Y direction and radial direction, lead pitch in the X direction and Y direction and missing and deformed leads, further comprising the step of calculating the Z dimension of the lead with respect to a seating plane based on Z world data.

32. *(Original)* The method of claim 31 further comprising the step of comparing the deviation values to predetermined tolerance values with respect to an ideal part as defined in a part definition file to provide a lead inspection result.

33. *(Previously Presented)* A method for three dimensional inspection of a lead on a ball array device, the method comprising:

illuminating the lead;

providing fixed optical elements to obtain both a bottom view of the lead and a side perspective view of the lead;

receiving at least the bottom view and the side perspective view of the lead using a camera;

transmitting the bottom view and the side perspective view of the lead to memory as pixel values;

determining a first lead reference pixel position in the bottom view;

determining a second lead reference pixel position in the side view;

converting the first and second lead reference pixel positions into a world value by using pixel values and parameters determined during a calibration.

34. *(Previously Presented)* The method of claim 33, wherein illuminating the lead is achieved using a single light source.

35. *(Previously Presented)* The method of claim 33, wherein illuminating the lead is achieved using more than one light source.

36. *(Previously Presented)* The method of claim 33, wherein the bottom view of the lead and a side perspective view of the lead are obtained in a single image.

37. *(Previously Presented)* The method of claim 33, wherein the bottom view of the lead and a side perspective view of the lead are obtained in more than one image.

38. *(Previously Presented)* The method of claim 33, wherein the parameters determined during the calibration are selected from the group consisting of: pixel scale factors, an angle at a particular point in a view, and correspondence of one or more pixel values to world values.

39. *(Previously Presented)* The method of claim 33, wherein the calibration includes resolving missing state values of an inspection system by imaging a precision pattern of known dimensions and spacing.

40. *(Previously Presented)* The method of claim 33, wherein the calibration includes determining and storing pixel values of features of a precision pattern of known dimensions and spacing.

41. *(Previously Presented)* The method of claim 33, wherein the calibration includes determining and storing deviations from ideal world locations of features of a precision pattern of known dimensions and spacing.

42. *(Previously Presented)* The method of claim 33, wherein a Z value is calculated by combining a deviation of the first lead reference pixel position from its ideal position with a deviation of the second lead reference pixel position from its ideal position.

43. *(Previously Presented)* The method of claim 33, further comprising: converting world values to Z deviations by calculating deviation values that represent the deviation of the lead from its ideal position.

44. *(Previously Presented)* The method of claim 33, further comprising: converting world values to coplanarity values by calculating deviation values that represent the deviation of the lead from a reference plane.

45. *(Previously Presented)* The method of claim 33, further comprising: converting world values to coplanarity values by calculating deviation values that represent the deviation of the lead from a seating plane.

46. *(Previously Presented)* The method of claim 33, wherein the illuminating is with a diffuse light.

47. *(Previously Presented)* The method of claim 33, wherein the illuminating is with a diffuse light for the bottom view of the lead.

48. *(Previously Presented)* The method of claim 33, wherein the illuminating is with a diffuse light for the side perspective view of the lead.

49. *(Previously Presented)* The method of claim 33, wherein the illuminating is with an overhead reflective diffuser.

50. *(Previously Presented)* A method for three dimensional inspection of a lead on a ball array device, the method comprising:

illuminating the lead;

providing fixed optical elements to obtain both a bottom view of the lead and a side perspective view of the lead;

receiving at least the bottom view and the side perspective view of the lead using a camera;

transmitting the bottom view and the side perspective view of the lead to memory as pixel values;

determining a first lead reference pixel position in the bottom view;

determining a second lead reference pixel position in the side view;

converting the first lead reference pixel position into a first world value and the second lead reference pixel position into a second world value by using pixel values and parameters determined during a calibration.

51. *(Previously Presented)* The method of claim 50, wherein illuminating the lead is achieved using a single light source.

52. *(Previously Presented)* The method of claim 50, wherein illuminating the lead is achieved using more than one light source.

53. *(Previously Presented)* The method of claim 50, wherein the bottom view of the lead and a side perspective view of the lead are obtained in a single image.

54. *(Previously Presented)* The method of claim 50, wherein the bottom view of the lead and a side perspective view of the lead are obtained in more than one image.

55. *(Previously Presented)* The method of claim 50, wherein the parameters determined during the calibration are selected from the group consisting of: pixel scale factors, an angle at a particular point in a view, and correspondence of one or more pixel values to world values.

56. *(Previously Presented)* The method of claim 50, wherein the calibration includes resolving missing state values of an inspection system by imaging a precision pattern of known dimensions and spacing.

57. *(Previously Presented)* The method of claim 50, wherein the calibration includes determining and storing pixel values of features of a precision pattern of known dimensions and spacing.

58. *(Previously Presented)* The method of claim 50, wherein the calibration includes determining and storing deviations from ideal world locations of features of a precision pattern of known dimensions and spacing.

59. *(Previously Presented)* The method of claim 50, wherein a Z value is calculated by combining a deviation of the first

world value from its ideal position with a deviation of the second world value from its ideal position.

60. *(Previously Presented)* The method of claim 50, further comprising: converting world values to Z deviations by calculating deviation values that represent the deviation of the lead from its ideal position.

61. *(Previously Presented)* The method of claim 50, further comprising: converting world values to coplanarity values by calculating deviation values that represent the deviation of the lead from a reference plane.

62. *(Previously Presented)* The method of claim 50, further comprising: converting world values to coplanarity values by calculating deviation values that represent the deviation of the lead from a seating plane.

63. *(Previously Presented)* The method of claim 50, wherein the illuminating is with a diffuse light.

64. *(Previously Presented)* The method of claim 50, wherein the illuminating is with a diffuse light for the bottom view of the lead.

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65. *(Previously Presented)* The method of claim 50, wherein the illuminating is with a diffuse light for the side perspective view of the lead.

66. *(Previously Presented)* The method of claim 50, wherein the illuminating is with an overhead reflective diffuser.